

In the claims:

1. (currently amended) A process carried out by a device for determining and outputting a transforming element for a given transformation function for a transformation of a digital signal, which transformation function comprises a transformation matrix and corresponds to a transformation of a the digital signal from the time domain into the frequency domain or vice versa, ~~wherein~~ comprising the steps of:

decomposing the transformation matrix ~~is decomposed~~ into a rotation matrix and an auxiliary matrix which, when multiplied with itself, equals a permutation matrix multiplied with an integer diagonal matrix;

decomposing the rotation matrix and the auxiliary matrix ~~are each decomposed~~ into a plurality of lifting matrices;

determining the transforming element is ~~determined to~~ comprise comprised of a plurality of lifting stages which correspond to the lifting matrices; and

2. (currently amended) The process of claim 1, wherein the transformation function is a ~~DCT~~ Discrete Cosine Transform-I transformation function, ~~DCT~~ Discrete Cosine Transform-IV transformation function, ~~DST~~ Discrete Sine Transform-I transformation function, ~~DST~~ Discrete Sine Transform-IV transformation function, ~~DFT~~ Discrete Fourier Transform-I transformation function, ~~DFT~~ Discrete Fourier Transform-IV transformation function, ~~DWT~~ Discrete Wavelet Transform-I transformation function or ~~DWT~~ Discrete Wavelet Transform-IV transformation function.

3. (previously amended) The process of claim 1, wherein the lifting matrices are each block-triangular matrices with two invertible integer matrices in one diagonal.

4. (original) The process of claim 3, wherein the invertible integer matrices in each lifting matrix are identity matrices or negative identity matrices.

5. (previously amended) The process of 4 claim 1, wherein the transforming element comprises five lifting stages.

6. (previously amended) The process of claim 1, wherein an audio signal or a video signal is used as the digital signal.

7. (currently amended) A device for determining and outputting a transforming element for a given transformation function for a transformation of a digital signal, which transformation function comprises a transformation matrix and corresponds to a transformation of a the digital signal from the time domain into the frequency domain or vice versa, the device comprising:

a first decomposition unit for decomposing the transformation matrix into a rotation matrix and an auxiliary matrix which, when multiplied with itself, equals a permutation matrix multiplied with an integer diagonal matrix;

a second decomposition unit for decomposing the rotation matrix and the auxiliary matrix each into a plurality of lifting matrices;

a determination unit for determining the transforming element to comprise of a plurality of lifting stages which correspond to the lifting matrices; and

outputting the transforming element for a predetermined application.

8. (currently amended) A method for transforming and outputting a digital signal from the time domain into the frequency domain or vice versa using a transforming element, wherein+

the transforming element corresponds to a given transformation function, which transformation function comprises a transformation matrix wherein the transforming element is determined by a process comprising:

decomposing the transformation matrix into a rotation matrix and an auxiliary matrix which, when multiplied with itself, equals a permutation matrix multiplied with an integer diagonal matrix;

decomposing the rotation matrix and the auxiliary matrix each into a plurality of lifting matrices; and

determining the transforming element to comprise of a plurality of lifting stages which correspond to the lifting matrices;

wherein each lifting stage comprises the processing of sub-blocks of the digital signal by an auxiliary transformation and by a rounding unit.

9. (currently amended) A device for transforming and outputting a digital signal from the time domain into the frequency domain or vice versa comprising a transformation unit for transforming the digital signal by a transforming element, wherein+

the transforming element corresponds to a given transformation function, which transformation function comprises a transformation matrix wherein the transforming element is determined by a process comprising:

decomposing the transformation matrix into a rotation matrix and an auxiliary matrix which, when multiplied with itself, equals a permutation matrix multiplied with an integer diagonal matrix;

decomposing the rotation matrix and the auxiliary matrix each into a plurality of lifting matrices;

determining the transforming element to comprise of a plurality of lifting stages which correspond to the lifting matrices; and

wherein for each lifting stage the device comprises an auxiliary transformation unit for processing sub-blocks of the digital signal and a rounding unit for processing sub-blocks of the digital signal.

10. (currently amended) A computer readable medium having a program recorded thereon, wherein the program is ~~adapted~~ executed to make a computer perform a process for determining a transforming element for a given transformation function for digital signal transformation, which transformation function comprises a transformation matrix and corresponds to a transformation of a digital signal from the time domain into the frequency domain or vice versa, ~~wherein~~ comprising:

the transformation matrix is decomposed into a rotation matrix and an auxiliary matrix which, when multiplied with itself, equals a permutation matrix multiplied with an integer diagonal matrix;

the rotation matrix and the auxiliary matrix are each decomposed into a plurality of lifting matrices;

the transforming element is determined to comprise of a plurality of lifting stages which correspond to the lifting matrices.

11. (currently amended) A computer readable medium having a program recorded thereon, wherein the program is ~~adapted~~ executed to make a computer perform a method for transforming and outputting a digital signal from the time domain into the frequency domain or vice versa using a transforming element, ~~wherein~~ comprising:

the transforming element corresponds to a given transformation function, which transformation function comprises a transformation matrix wherein the transforming element is determined by a process comprising

decomposing the transformation matrix into a rotation matrix and an auxiliary matrix which, when multiplied with itself, equals a permutation matrix multiplied with an integer diagonal matrix;

decomposing the rotation matrix and the auxiliary matrix each into a plurality of lifting matrices;

determining the transforming element to comprise of a plurality of lifting stages which correspond to the lifting matrices;

each lifting stage comprises the processing of sub-blocks of the digital signal by auxiliary transformations and by a rounding unit.

12. (previously added) The process of claim 2, wherein the lifting matrices are each block-triangular matrices with two invertible integer matrices in one diagonal.

13. (previously added) The process of claim 12, wherein the invertible integer matrices in each lifting matrix are identity matrices or negative identity matrices.